REMARKS:

Claims 1-9, 11, 56-58, 62-69, 71-78, 80 and 81 are pending.

For the convenience of the Examiner, attached at the end of this document is a clean "Claims Appendix" of the current wording of all pending claims.

Claims 1-9, 11, 56-58, 62-69, 77-78, 80 and 81 were rejected under Section 112 for a variety of informalities. These claims have been revised to remove the specific objections set forth in the Office Action or by rephrasing or rearranging the claim limitations to make the claims more easily readable. These changes were made for purposes of clarification unrelated to patentability concerns.

In view thereof, the retraction of the Section 112 rejection is requested.

All pending claims were rejected for obviousness. For all but independent claim 81, the Porzi patent (4,849,625) constitutes the primary reference. In each instance, Porzi was combined with WO '335, alone or in combination with additional secondary references.

Independent claim 81 was primarily rejected over EP '823. It too was combined with WO '335 and an additional secondary reference.

I. The Present Invention

A very important aspect of the present invention is that coffee can be roasted in a closed environment, e.g. inside a retail store such as a supermarket, without polluting or overheating the indoor environment while requiring no ventilation of the exhaust gases to the exterior. The coffee beans are roasted with heated air in a roasting drum. The exhaust air from the roasting drum (which is laden with pollutants and has a high temperature) is substantially completely cleaned <u>and</u> cooled to about room temperature, and continuously discharged into the closed environment surrounding the coffee roaster, while coffee roasting is in progress.

The present invention permits supermarket operators to roast the anticipated daily requirement in the morning (or at another appropriate time) of each day to assure that its customers always get freshly roasted coffee. This, for example, may involve roasting beans in

batches of six pounds (page 21, lines 7-9 of application), although larger or lesser amounts may of course be roasted, depending on the anticipated daily demand for particular bean types.

Coffee beans have about 130 different chemical constituents, most of which are not found in ordinary food products. During roasting, heat is quickly and relatively evenly applied to the beans, thereby subjecting the beans to pyrolysis, which transforms some of the chemicals into others, releases pollutants, and further drives off other constituents of the beans (Torbet Declaration attached to Amendment dated February 9, 2001, paragraph 7). Thus, large amounts of pollutants are generated during coffee roasting. Appropriately disposing of the pollutants is difficult. In the past, they were simply discharged to the atmosphere, sometimes with and at other times without pretreating the exhaust gases, for example by burning the pollutants in an afterburner before venting them.

The present invention eliminates the need to vent the polluted exhaust gases from the roaster to the exterior and to employ afterburners or other anti-pollution devices to cleanse the exhaust gases prior to their release. According to the present invention, the exhaust gases from coffee roasting are discharged directly into a closed environment, for example rooms frequented by humans, such as supermarkets, where the method of the present invention is commonly practiced.

The present invention accomplishes this by cleaning the hot exhaust from the roasting chamber so that it is substantially clean <u>and</u> cooling the gases so that they can be discharged directly into the surrounding room without polluting and/or overheating it and rendering it uninhabitable. This is done by simultaneously and continuously performing the steps of roasting the beans and filtering, reheating, cooling and discharging the exhaust into a closed room while roasting is in progress.

Another aspect of the present invention monitors in real time the progress of the coffee roasting so that undesired deviations in the <u>development</u> of the beans being roasted can be adjusted in real time to precisely replicate the preestablished roasting process and aroma profile of the beans, as is discussed on pages 5 and 6 of the present application. As a result, corrective action can be taken instantly without having to await the completion of the roast and

a subsequent aroma test to determine whether or not the desired taste and aroma profile of the beans have been attained.

II. The Porzi Reference

Porzi discloses to monitor the progress of a coffee roast by arranging multiple photo-emitters (1) about a centrally located fiber bundle end (19), mounting them in a common, cooled housing, and affixing the housing onto a flange surrounding an inspection glass (4) on a hatch (5) of a coffee roaster. Beans being roasted contact the other side of the inspection glass. Light generated by the emitters is directed through the inspection glass onto the beans on the other side thereof. Some of the light from the emitters reflected by the beans is captured by the fiber bundle end and relayed to a photo-detector (2). The captured, reflected light is compared with a control setting from a colorimeter (7) of a processing unit (6), and when the two match the roasting oven is shut off (column 4, lines 3-29).

Porzi is concerned with solving the prior difficulty of accurately monitoring the color of the beans during roasting. The high temperature in the vicinity of the roasting drum and the sensitivity of the photo-detector and, to a lesser extent, of the photo-emitters as well, to ambient temperature changes adversely affects the readout of the detectors, which can lead to wrong roasting termination signals. In other words, Porzi seeks to eliminate "thermally-induced" measurement errors (column 2, line 32).

Porzi does this by placing the photo-detector remotely from the inspection glass inside a processing unit (6) while abutting the photo-emitters against the inspection glass (4) and, to prevent signal drift due to a heating of the photo-emitters, mounting them in a cooled housing.

Porzi is further concerned with disturbances and measurement inaccuracies resulting from ambient light that might interfere with the photo-detectors and/or receivers. This is eliminated by totally enclosing the photo-emitters as well as the photo-detector (column 4, lines 11-16).

With respect to actual coffee roasting, the disclosure of Porzi is limited to the observation that the oven will be shut off "the moment that the color of the roasting commodity

matches the sample color" (column 1, lines 37-38). Porzi further discloses that the output of the colorimeter reflects "either a prescribed roast characteristic of the end product, or the amount of heat to be applied during the roast step" (column 2, lines 44-47). Finally, Porzi notes that the roaster has a display for monitoring "the effective color of the commodity 8 continuously as the roast progresses" (column 4, lines 20-21). Beyond that, the disclosure of Porzi is limited to constructional details of the manner in which the photo-detector and photo-emitter are mounted in the cooled housing attached to the roaster.

III. The EP '823 Reference

This European application teaches to roast coffee beans by using a sample of roasted beans as a reference and comparing the color of the sample to the color of the beans being roasted in a comparator. When there is a match, roasting is discontinued.

IV. The Secondary References

The Brookman patent discloses a gas scrubber which can be used in coffee roasting plants. It employs a wet scrubber with filters to remove odors and contaminants from the exhaust gas to help avoid contaminating the earth's atmosphere.

The WO '335 reference appears to conform in substance to U.S. patent 5,928,697. WO '335, as well as the '697 patent, disclose the use of a catalytic converter to help reduce the pollutants in the exhaust before it is discharged to the atmosphere.

The Hansen patent discloses a device for "cooking prefried low fat potato pieces" (column 2, line 2) by placing the pieces in a cooking chamber that is heated by quartz lamps. The cooking chamber communicates via heat exchanger tubes 5 with a filter housing (11). A blower (7) induces an air flow from an intake (6) into the cooking chamber via tubes (5) into the filter housing where some of the pollutants generated in the cooking chamber are removed. The filtered air flows through conduit (8) from where it is partially discharged via outlet (9) to the exterior while another portion of the filtered air is recirculated into the filter housing through ports (24). The purpose of the filter is to purify the air, but it is not capable of doing so adequately. Thus, Hansen requires:

> "To further purify the air there is provided in the wall of air in-let chamber 21, opposite to air out-let canal 8 and 9, a number of intake openings 24. As a result of the low pressure in air in-let chamber 21, part of the air out-let canal 8 will be drawn in once more through inlet ports 24 and be subject to yet another cleaning by re-circulation through the filter device." (column 4, lines 44-51)

The portion of the air in outlet canal 8 not drawn through inlet ports 24 is not subject to such further cleaning by recirculating it through the filter. This portion of the air exits to the exterior through outlet 9 and will continue to carry pollutants.

The Grubbs patent discloses (column 6, line 65 to column 7, line 57) to measure "the light reflected by a single flake particle impinged with light from a standardized source" (column 7, lines 6-9). This is done by placing a "random sample flake, of a size which permits handling, … on a movable platform or table within a light-tight enclosure". The table is adjustable for forward, backward and lateral movement (column 7, lines 10-15). A helium-neon gas laser operating at a wave length of 632.8 nm (column 7, lines 45-48) directs light through a hole in an enclosure surrounding the movable platform so that it impinges upon "the sample flake. … the flake surface is scanned by manual adjustment of the platform to locate the point of highest reflectance as detected by the fiberoptic sensor."

Grubbs' process is limited to the inspection of a single sample flake which must be mounted on a freely movable table for manually positioning the flake to generate maximum reflectance. These flakes are neither in a heated environment, nor do they move or tumble, as is the case during roasting of coffee beans.

The Gell patent discloses a coffee roaster in the form of an oven 10, 11 into which green beans are placed and from which roasted beans are withdrawn following completion of the roasting step. On the front of the housing, there is a rotary switch 19 which permits one to set ten different roasts, from light brown (selection #1) to black and very oily beans (selection #10), as is described in column 4, line 61 to column 5, line 19 of the patent.

The Scher patent discloses a system for predicting the color of food products being processed (e.g. heated, roasted and the like) and using the predicted color to control and terminate the process. The predicted values are compensated for so that the predictions track the real response by an amount that can be estimated. Amongst others, Scher measures the infrared reflectance of the food product and envisions the use of multiple roasters in the system.

The Helbling patent discloses a coffee machine which can dispense a variety of beverages such as decaffeinated and regular coffee, hot water and the like and for automatically dispensing cup quantities of such beverages. The patent notes (column 7, lines 52-57) that an empty carafe placed at an appropriate station of the machine can be detected by weight sensors.

V. Claim Amendments

All independent claims which included a limitation to the effect that the exhaust gases are flowed through a catalytic converter were amended by deleting this limitation since it is not needed for the allowance of the claims. Further amendments to the claims are discussed below.

VI. Argument

All independent claims, except for claim 81, were primarily rejected over Porzi because Porzi discloses coffee roasting which involves the use of a photo-emitter and a photo-detector for monitoring the color of the beans during roasting, a colorimeter which generates a reference signal indicative of the desired color, and a comparator which terminates roasting when the signals from the colorimeter and the photo-detector match. The only difference between the previously pending claims and Porzi noted in the Office Action was that Porzi did not disclose the use of a catalytic converter.

The use of catalytic converters was viewed as being obvious in view of WO '335. Since the claims herein have been amended and no longer recite the use of catalytic converters, WO '335 adds nothing to Porzi so far as the present invention is concerned.

A most important aspect of the present invention is that coffee roasting takes place in a closed environment, e.g. inside a retail store such as a supermarket, without polluting and/or overheating the indoor environment and, also, without requiring the conventional ventilation of the exhaust to the exterior. This is made possible by substantially completely cleaning and cooling the exhaust (which is laden with pollutants and which has a very high temperature) to about room temperature (no more than about 115° F, as stated on page 9, lines 10-11 of the application) while the exhaust gases are still in the roaster and thereafter continuously discharging the exhaust into the closed environment surrounding the coffee roaster while roasting is in progress.

In addition to enabling coffee roasting in an indoor environment without any need for venting the exhaust to the exterior (which greatly reduces installation and operating costs for the roaster), the present invention further eliminates the heretofore troublesome atmospheric pollution caused by coffee roasting installations. Finally, the present invention avoids an undesirable moisture buildup inside the roasting machine. Fresh (green) beans have a moisture content of up to 20%, which is driven off by the high roasting temperatures. This moisture must be removed from the exhaust to prevent a fouling of interior surfaces. Closed systems, which recirculate all heating air during roasting, retain all moisture inside the machine, which leads to a rapid moisture buildup and an unacceptable fouling of interior surfaces.

Independent claims 1 and 71 and dependent claims 2, 3, 72 and 78 were rejected for obviousness over Porzi in view of WO '335.

Independent claim 1 is limited, amongst others, to filtering substantially all pollutants from the heated air following the roasting step, reheating and recirculating a major portion of the pollutant-free air to continue roasting, and discharging a minor portion of the filtered air into an interior of a building frequented by humans while roasting continues with the recirculated air.

Porzi has no disclosure concerning the manner in which polluted air is processed and discharged because Porzi is not concerned with the constituents of the exhaust, how the exhaust is processed, and how it is discharged.

Applicants note that the rejection of independent claims 1 and 71 was supported by the observation that Porzi naturally requires "some means of exhaust", that the amount of heat applied during roasting is monitored and which improves air quality, and that monitoring and adjusting the air temperature "acts to better control the roasting conditions". These observations are not part of the disclosure of Porzi and are merely speculations as to what Porzi may or may not have in mind over and above the disclosure in the patent. Moreover, claim 1 is not limited to "some means of exhaust", to "monitoring the amount of heat applied during roasting" or to generally "improving air quality", as asserted in the Office Action.

Claim 1 is limited to an indoor coffee roasting method in which the exhaust gas is cleaned so that it is substantially pollutant-free <u>and</u> cooled so that a minor portion of the cleaned exhaust gases can be discharged directly into an interior space frequented by humans without rendering that space uninhabitable. Porzi has no corresponding disclosure or suggestion which would lead one of ordinary skill in the art to such a method.

Claim 1 is further limited to reheating and recirculating a major portion of the air through the roasting machine and "cooling a minor portion of the filtered air to no more than about 115° F and discharging the cooled minor portion of the air into an interior of a building frequented by humans …; the steps of roasting, filtering, reheating, recirculating, cooling and discharging being simultaneously and continuously performed while roasting is in progress; …." Neither Porzi nor any of the cited references disclose or in any form suggest cleaning the coffee roasting exhaust of all pollutants, cooling the air to no more than about 115° F so that it can be discharged in a closed environment such as a supermarket without rendering it uninhabitable and coating everything inside the store with an unacceptable layer of soot, and performing the roasting, filtering, cooling, discharging, etc. steps simultaneously and continuously while roasting is in progress.

In the past, the coffee roasting exhaust was vented directly to the exterior with or without an attempt to remove some of the pollutants. No reference suggests to simultaneously and continuously clean, cool, and discharge, etc. the exhaust gas while roasting is in progress and so that the exhaust can be discharged into interior spaces without

overheating them. This concept, which is present in all independent claims, except for claim 71 discussed below, is novel and unobvious in the art of coffee roasting.

For the reasons discussed at length above, independent claim 1 and therewith claims 2 and 3 which depend from it are not obvious over Porzi, alone or in combination with WO '335.

Independent claim 71 was rejected on the same basis as claim 1. Claim 71 recites, amongst others, "generating at least one second parameter which reflects a predetermined *development* of the first parameter during a roasting of the coffee beans; ... monitoring the at least one second parameter during roasting; and adjusting the roasting step when the second parameter indicates that a deviation from the predetermined *development* of the first parameter occurred to thereby reestablish the predetermined development of the second parameter".

The importance of monitoring the *development* of the first parameter, e.g. the darkness or color of the coffee beans, is set forth in some detail on page 8, lines 4-18 of this application as follows:

> "In addition, the progress of the roasting operation, and in particular the change in darkness or *development* of the beans during roasting, is monitored in real time and compared to the darkness change encountered during the sample roast. If, during a subsequent on-site production roast, the darkness (or color) *development* of the beans deviates from that recorded during the sample roast, other roasting parameters, such as the hot roasting air temperature and/or the roasting air flow rate, are adjusted until the change in darkness corresponds to that established by the sample roast. This assures that the coffee bean finish obtained during the sample roast and judged to be optimal for the bean is precisely replicated during each production roast on each of the individual roasting machines that form part of the overall system". (italics added.)

Claim 71 requires that two parameters be generated: a first one that reflects the desired color or degree of darkness of the beans to yield the intended aroma, and a second parameter that reflects the *development* of the first parameter during roasting. The first parameter determines the ultimate color (or degree of darkness) that is to be attained, not when or how it is attained. The second parameter determines when or how the color of the beans is attained, that is, the *development* of the bean color. In this regard, the paragraph bridging pages 5 and 6 of the application states in relevant parts:

> "A very important advantage of the present invention is that it permits one to replicate roasting results by using the darkness (or color) development time line for the beans being roasted .... This is central to maintaining the consistency of the roasts and is not just a function of the final darkness (or color) of the beans. How that darkness is attained also determines the final profile of the roasted product, e.g. the roasted beans, because the same darkness (or color) can be attained over a wide range of roasting times, which in turn depends on other parameters such as, for example, the roasting temperature. The profile of the roasted beans will vary greatly based on how the ultimate color was attained. .... Thus, the key to consistency in the profile is to roast the beans in the same way, time after time. This is accomplished ... [by] maintaining the preestablished darkness (or color) *development* time line and parameters. In the past this was impractical, if not impossible, because there was no real-time color monitoring of the beans being roasted inside the roasting drum." (italics added)

Porzi contains no suggestion of measuring the *development* (as the term is used in this application, including the claims) of the bean color or other roasting parameter that is monitored. It simply states that the oven is shut off when the sensed bean color matches the color that was preset in the colorimeter (column 1, lines 39-40).

Thus, Porzi has no disclosure whatsoever that is relevant to correcting deviations in the *development* of the second parameter as recited in claim 71. Claim 71, and therewith claims 72 and 78 depending from it, are therefore not obvious over Porzi, alone or in combination with WO '335.

Independent claim 11, and dependent claims 9 and 77, were rejected for obviousness over Porzi, WO '335 and Hansen. The rejection relied on Hansen because Porzi "would naturally require some means of exhaust" and Hansen teaches to incorporate cooling in methods for roasting foods, and Hansen teaches that the emission of "heat, smoke, and odors to the surrounding air" is an inconvenience to customers and staff.

Hansen subjects prefried potatoes to heat for no more than about three minutes to give them the "crisp and crunchy consistency of the potato pieces which is characteristic of french fried potatoes" (column 2, lines 5-6 of Hansen).

Cooking prefried (and frozen) potatoes to make them crisp and crunchy employs a process that has no relationship to coffee roasting. The prefried potato pieces are cooked for only a short time, sufficient to drive off water and make them crisp and crunchy. During this short-term heating process, chemical reactions are limited, primarily to the coagulation of starch contained in the potatoes and the caramelizing of sugar therein (column 7, lines 61-65 of Hansen). Otherwise, the first minute of the cooking process is taken up by thawing the previously frozen potatoes and bringing their temperature to about 120° C to drive off water (column 7, lines 56-59), while during the third minute of cooking the final browning and drying of the potatoes takes place (column 8, lines 3-5 of Hansen). In sum and substance, therefore, the cooking of prefried french fries according to Hansen takes up little time, and generates primarily hot air containing some water and fat that is driven off the potatoes during cooking, and some smoke. Directing the exhaust from the fryer through a simple filter, as is disclosed in Hansen, sufficiently cleans the exhaust so that it can be discharged, provided at least some of the exhaust is recirculated through the filter.

Coffee roasting differs vastly from cooking prefried potatoes. Coffee beans have an entirely different consistency and structure than potatoes. Coffee beans must be subjected to heat for a much longer period than is necessary for cooking prefried potatoes, so

that the coffee beans are chemically altered to give them the desired dark brown color, brittle structure and aroma. In the process, large amounts of hydrocarbons are driven off, oils are released and partially burned, and chemical reactions occur, which do not occur when cooking prefried potatoes because potatoes lack almost all of the constituents found in coffee beans and/or because chemical reactions are not initiated during the relatively short time while prefried potatoes are cooked. Coffee beans have about 130 different chemical constituents, most of which are not found in ordinary food products. During roasting, heat is quickly and relatively evenly applied to the beans, thereby subjecting the beans to pyrolysis, which transforms some of the chemicals into others, releases pollutants, and further drives off other constituents of the beans (Torbet Declaration of record, paragraph 7).

Coffee roasting releases large amounts of pollutants such as smoke, white plume smoke, hydrocarbons and volatile organic compounds ("VOCs"), including SO_2, NO_2 and particulates as small as ½ micron (page 2, lines 6-9 and page 23, lines 18-23). The amount of pollutants, excluding water driven off the beans during roasting, is approximately 36 grams per pound of coffee roasted (Torbet Declaration, paragraph 4). As is disclosed in the application, roasting machines capable of practicing the invention recited in the pending claims are frequently installed in supermarkets, where coffee beans are roasted daily, as is described, for example, on page 3, lines 9-20, page 11, lines 26-30, and page 14, lines 9-13.

Roasting machines that practice the present invention typically roast coffee beans daily to supply the anticipated daily demand for roasted coffee beans. Depending on the store, this presently requires roasting about 50 pounds, and it is anticipated that this may increase to as much as 100 pounds of coffee beans per day as the machines become increasingly known and accepted. Under such conditions and at an average roasting time for a six-pound batch of coffee beans of about 12 minutes, roasting will take between about one and one-half to three hours. Roasting is typically done once a day, for example in the morning. When roasting about 50 pounds of coffee beans over a one and one-half hour period, or 100 pounds over about a three-hour period, between approximately 1800 grams and 3600 grams of pollutants are generated and released into the interior of an average-size supermarket at the hourly rate of approximately 1200 grams, which would render the supermarket uninhabitable. Moreover, the released pollutants would contaminate the interior of the supermarket, including

products for sale, with soot, particulates, oily deposits and undesirable odors that would keep customers away and damage merchandise (Torbet Declaration, paragraph 5).

Thus, the quantity of pollutants released during coffee roasting (on a per-unit basis) is vastly greater than the amount of pollutants released during cooking prefried potatoes. Commercial coffee roasting (in a supermarket, for example) involves the roasting of relatively large quantities of coffee, that is, usually at least about 50 pounds per day, and sometimes significantly more than that, which increases the volume of pollutants generated over a given time period far above anything encountered when cooking individual orders of prefried potatoes. The problems associated with removing pollutants from the exhaust of a coffee roaster and the exhaust from a prefried potato cooker therefore differ qualitatively and quantitatively, which requires vastly different approaches for effectively removing the pollutants from the respective exhausts. As a consequence, the two processes become incomparable (Torbet Declaration, paragraph 8).

If the amount of pollutants generated by coffee roasting were released into the closed interior of an average supermarket, the air in the supermarket would become unbreatheable before the first batch had been roasted (Torbet Declaration, paragraph 10). In fact, in the past this large amount of pollutants released during coffee roasting made it necessary to not only vent the exhaust to the exterior, but to employ expensive and energy-consuming afterburners or other anti-pollution devices to comply with atmospheric pollution regulations and restrictions (page 2, lines 9-14 of the present application, and Torbet Declaration, paragraph 11).

As a result of the foregoing, one of ordinary skill in the art of coffee roasting would not consult the art of cooking prefried potato pieces, such as the Hansen patent, for guidance concerning the removal of pollutants from exhaust gases generated during coffee roasting so that such gases can be directly vented into closed environments, for example the interior of supermarkets, because of the vastly greater amounts of and different types of pollutants that are generated during coffee roasting.

Operationally, the Hansen patent discloses to cook "prefried low fat potato pieces" (column 2, line 2) by placing them in a heated cooking chamber that communicates via

heat exchanger tubes 5 with a filter housing (11). A blower (7) induces an air flow from an intake (6) into the cooking chamber via tubes (5) into the filter housing where some of the pollutants generated in the cooking chamber are removed. The filtered air flows through conduit (8) from where it is partially discharged via outlet (9) to the exterior while another portion of the filtered air is recirculated into the filter housing through ports (24). The purpose of the filter is to purify the air, but it is not capable of doing so. Thus, Hansen requires:

> "To further purify the air there is provided in the wall of air in-let chamber 21, opposite to air out-let canal 8 and 9, a number of intake openings 24. As a result of the low pressure in air in-let chamber 21, part of the air out-let canal 8 will be drawn in once more through inlet ports 24 and be subject to yet another cleaning by re-circulation through the filter device." (column 4, lines 44-51)

The portion of the air in outlet canal 8 not drawn through inlet ports 24 is not subject to such further cleaning by recirculating it through the filter. This portion of the air exits to the exterior through outlet 9 and continues to carry pollutants. For roasting coffee beans, this would unacceptably pollute interior spaces such as supermarkets.

All claims, including specifically claim 11, are expressly limited to methods of roasting coffee beans. This clearly delineates the claims from cooking other food products such as prefried potatoes.

Hansen is therefore not an effective reference because Hansen is inherently incapable of fully cleaning even slightly polluted air, much less does it disclose to clean heavily polluted coffee roasting air so that it can be discharged into closed spaces. Being so fundamentally different from the present invention, Hansen is also nonanalogous art.

Independent claim 11 is limited, amongst others, to roasting coffee beans, including cleaning the exhaust so that it is substantially pollution-free, and "cooling the air after the air has passed the fresh beans to no more than about 115° F while continuing flowing the heated air over the fresh beans; [and] discharging the cooled, pollutant-free air into a substantially closed room frequented by humans ...; the steps of removing, cooling,

discharging and recirculating being simultaneously and continuously performed while roasting is in progress; …."

Porzi, alone or in combination with Hansen (and with or without WO '335), do not suggest the above-discussed features of claim 11. Claim 11 is therefore not obvious over these references.

Dependent claims 9 and 77 depend from allowable parent claims 1 and 71. Since the parent claims are allowable, as was discussed above, claims 9 and 77 are also allowable.

Dependent claims 4-6 and 73-74 (which depend from independent claims 1 and 71, respectively) were rejected for obviousness over Porzi and WO '335 in combination with Grubbs. Grubbs was relied on as teaching a method for evaluating coffee bean color with a laser which may, for example, have a wave length of 632.8 nm.

As was discussed above, independent claims 1 and 71 are not obvious and are patentable over the prior art. Claims 4-6 and 73-74 derive their patentability from their dependency on allowable claims 1 and 71.

Claims 7-8 and 75-76 (which depend from independent claims 1 and 71, respectively) were rejected for obviousness over Porzi and WO '335 in view of Gell because Gell "teaches a coffee roaster with settings for multiple types of beans and roasting levels". Reliance on Gell was thought to be justified because Gell was viewed as teaching that "coffee beans come in different sizes and densities which can effect the roasting time (column 5, line 10) and since Camerini Porzi is primarily directed to controlling the roasting time of coffee beans by monitoring their color …."

Gell discloses a device in which "an individual consumer may roast a small amount of coffee to a predetermined degree …." (column 2, lines 47-48). After noting that in the past coffee devotees roasted their beans in iron skillets, which was a difficult task, Gell discloses that the home roasting device has a rotary switch 19 which permits one to select differing degrees of roast, from light brown to black.

Claims 7, 8, 75 and 76 are limited to providing multiple coffee bean types, and establishing a roasting profile for each type so that the operator of the machine may select a given bean type and roast the beans according to a preestablished regimen to assure optimal taste. Gell, on the other hand, discloses no more than a coffee roaster with a switch which enables the user to keep the roaster on for varying lengths of time to choose between light brown to black roasts. Providing multiple types of beans, establishing a roasting profile for each, and roasting each bean type for optimal aroma which is peculiar to the bean in question is not the same as varying the degree to which a given bean is being roasted. For this reason alone, claims 7, 8, 75 and 76 are not obvious over the prior art, including Gell.

In addition, these claims are allowable because they depend from allowable parent claims.

Independent claims 62 and 80, and dependent claims 62-64, were rejected for obviousness over Porzi in view of Brookman and WO ‘335.

Independent claims 62 and 82 are similar and they each require, amongst others, “while flowing heated air over the fresh coffee beans removing substantially all pollutants from the air …, cooling at least a portion of the air downstream of the fresh coffee beans to no more than about 115° F and thereafter, while continuing to flow heated air over the fresh coffee beans, exhausting the cooled air directly into a room of a building without recirculating any part of the cooled air into the filtration system; ….” (claim 62). Claim 80 has the same limitations, except that it requires exhausting the cooled air into a supermarket instead of into a room of a building.

Independent claims 62 and 80 distinguish over Porzi (with or without WO ‘335) for substantially the same reasons why independent claims 1 and 71 are allowable, namely because the claims require the simultaneous roasting, removal of all pollutants from the exhaust gas, and cooling of the exhaust gas before it is discharged into a closed room frequented by humans.

Brookman was relied on as teaching the cleaning of the gas, which is not disclosed in Porzi, and because Brookman “is effective at removing odors and other undesirable contaminants in the gas which can be harmful”.

Brookman teaches to roast coffee by using a cyclone separator 3 and a wet scrubber 1 where the pollutants are wetted to facilitate their capture in filters. There is no desire in Brookman to discharge the exhaust from the coffee roaster into a closed environment, and there is no disclosure in Brookman to cool the exhaust gases so that they can be discharged into a closed room. Brookman mentions that there is some cooling of the gas stream to facilitate condensing vaporous contaminants, but Brookman has nothing to do with treating the exhaust so that it can be discharged into closed rooms. The latter is only disclosed in the present application, and reliance on Brookman for disclosing this aspect of the present invention is an impermissible hindsight reconstruction of the prior art based not on what the prior art teaches, but what is taught in the present application.

Thus, Porzi and Brookman (with or without WO '335) do not suggest the present invention as defined by independent claims 62 and 81. Accordingly, claims 62 and 81 are allowable.

Claims 63 and 64 depend from claim 62 and are directed to specific features of the present invention not disclosed in the prior art. These claims are allowable in their own right, and they are further allowable because they depend from an allowable parent claim.

Independent claim 56 was rejected for obviousness over Porzi and WO '335 together with Hansen, Grubbs and Scher. Scher was relied upon as disclosing a control system having multiple roasters and monitoring the color of the product.

Independent claim 56 is directed to operating a system which has a central computer and multiple, geographically separate roasting machines. The roasting parameters for each type of bean are centrally established and downloaded to the individual roasting machines to control the actual roasting. Amongst others, claim 57 requires removing all pollutants from the exhaust air, "cooling the used air; discharging at least a portion of the cooled air into the enclosed room while continuing heating the fresh beans; [and] recirculating a remaining portion of the cooled air to the hot air supply; the steps of removing, cooling, discharging and recirculating being simultaneously and continuously performed while roasting is in progress; ...." Like independent claim 1 discussed above, claim 56 requires the simultaneous cleaning, cooling and discharge of the cooled air into an enclosed room, which is

neither disclosed or in any form suggested by Porzi, with or without WO '335. This is also not disclosed in the secondary Grubbs and Hansen references discussed above. Scher does not supply what is missing from the other references applied to claim 56.

For this reason alone, claim 56 is not obvious.

In addition, Scher was applied against claim 56 because it teaches "a control system for roasting comprising multiple roasters (column 3, line 15) ...." The relied-on portion of Scher simply discloses that the "second I/O section 26 allows for direct sensor communications to the VME bus 22 and for system expansion (i.e. additional roasters 10)". Neither this portion of Scher, nor any other part thereof, discloses or in any manner suggests the above-discussed limitations of claim 56, including the manner in which individual roasting machines are controlled from a central control station and by downloading roasting signals from the central station to attain an optimal roast for the bean type in question.

Thus, independent claim 56 is not obvious over Porzi, WO '335, Hansen, Grubbs and Scher.

Dependent claim 57 was rejected over the same references as its parent claim 56 in combination with Helbling because "Helbling teaches a method of making coffee including a weight sensor which detects when a station is empty and generates an 'empty' signal (column 7, line 54)".

Helbling discloses a coffee brewing machine, not a coffee roaster, which has stations for placement of carafes. Helbling states that empty carafes can be detected with weight sensors.

Claim 57 is limited to keeping an inventory of fresh beans, generating a low-inventory signal when the supply of beans drops below a predetermined level, and placing fresh beans into the roasting machine when a low-inventory signal is received. Helbling has no corresponding disclosure because weighing a container as is done in Helbling is not the same as keeping and maintaining the fresh bean inventory recited in claim 57. For this reason alone, claim 57 is not obvious over the applied references, including Helbling.

In addition, claim 57 is allowable because it depends from allowable parent claim 56.

Claim 58, which depends from claim 56, was rejected on the same grounds as claim 56, and further in view of Gell. The rejection was justified because all applied references are "directed to methods of roasting food products".

Claim 58 is directed to determining, storing and downloading from the central control station to the individual roasting machines the roasting parameters which are required for roasting a variety of different bean types.

As was discussed at some length above, Gell discloses a roaster for roasting small quantities of beans and includes a switch for selecting the degree of darkness to which the beans are to be roasted. Gell contains no disclosure concerning establishing roasting parameters for different bean types so that each bean type is optimally roasted, centrally storing the roasting parameters, and downloading them on demand. For this reason alone, claim 58 is not obvious over the applied references.

In addition, claim 58 is allowable because it depends from allowable parent claim 56.

Claims 65-67, which depend from claim 62, are directed to the specifics of the laser light which is used for spectrally analyzing the coffee beans during roasting. These claims were rejected like their parent claim 62 in view of Grubbs since the references "are all directed to methods of roasting coffee beans". The references do not disclose any of the features recited in claims 65-67, and the Office Action does not assert otherwise. These claims are therefore allowable in their own right and further because they depend from allowable parent claim 62.

Claims 68-69 were rejected over the prior art like their parent claim 62 and further in view of Gell. Here too, all references were applied "since they are all directed to methods of roasting".

Claims 68 and 69 are directed to specific steps that are practiced for roasting coffee from any one of a multiplicity of different bean types. The claims require that optimal

roasting parameters be established for each bean type. None of the prior art references, including specifically Gell, discloses or in any form suggests a machine which holds multiple bean types and generating and storing optimal roasting parameters for each bean type. For this reason alone, claims 68 and 69 are allowable.

These claims are further allowable because they depend from allowable parent claim 62.

Finally, independent claim 81 was rejected for obviousness over EP '823 in view of Brookman and WO '335.

Claim 81 is limited, amongst others, to a sample roast to preestablish optimal roasting parameters, storing that parameter, simultaneously roasting the beans, cleaning the heated exhaust air so that it is substantially pollutant-free, cooling the air to no more than about 115° F while continuing to heat the fresh beans, and discharging the cooled, pollutant-free air into a supermarket.

Similar to independent claims 1 and 71 discussed above, claim 81 is limited and thereby patentably distinct from the applied references because the claim requires the simultaneous roasting of the beans, cleaning and cooling the exhaust, and discharging the exhaust into a closed room, which is neither disclosed nor suggested in the prior art in general and the references applied against claim 81.

The rejection of claim 81 was justified because of the Examiner's view that "it would have been obvious to one of ordinary skill in the art to place the coffee roaster of EP 0040823 inside a building, such as a supermarket, since roasters were commonly placed in stores and buildings".

Applicants do not dispute that roasters are commonly placed in buildings and perhaps even stores. However, in each and every instance known to applicants, and certainly in each and every reference applied against claim 81, which addresses how the exhaust is vented, the exhaust from the coffee roaster is not and cannot be discharged into a closed room. A vent to the exterior of the room is required.

The present invention eliminates the need for such vents. Thus, applicants strongly disagree that it would have been obvious to place coffee roasters inside buildings if that includes discharge of the coffee roasting exhaust into the building.

Claim 81 is therefore not obvious over EP '823, Brookman and WO '335.

In view of the foregoing, applicants submit that all claims are in condition for allowance. The issuance of a formal notification to that effect at an early date is requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,

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MARKED-UP VERSION OF THE CHANGES TO THE CLAIMS

1. (five times amended) A method of roasting coffee beans comprising the steps of establishing the degree to which the coffee beans must be roasted to attain a desired aroma; generating a measurable first parameter which is indicative that the coffee beans have been sufficiently roasted to yield the desired aroma; storing the first parameter; roasting fresh coffee beans at a roasting temperature by flowing heated air over the fresh coffee beans; filtering substantially all pollutants from the heated air following the roasting step[, including flowing the heated air through a catalytic converter]; thereafter reheating and recirculating a [relatively] major portion of the substantially pollutant-free air over the fresh coffee beans to thereby continue roasting; [discharging a relatively] cooling a minor portion of the filtered air to no more than about 115° F and discharging the cooled minor portion of the air into an interior of a building frequented by humans while reheating and recirculating the relatively major portion of the air for further use during roasting; the steps of roasting, filtering, reheating, recirculating, cooling and discharging being simultaneously and continuously performed while roasting is in progress; monitoring a second parameter which is compatible with the first parameter and is generated by the fresh coffee beans during roasting; and, upon detecting a match between the first and second parameters, discontinuing the roasting step.

9. (amended) A method according to claim 1 wherein the roasting step comprises flowing heated air over the fresh coffee beans, [and including the steps of] wherein the filtering step comprises removing substantially all pollutants from the air downstream of the fresh coffee beans being heated, and including cooling the air downstream of the fresh coffee beans to [substantially room temperature] no more than about 115° F, and thereafter exhausting the cooled air into a room of a building.

11. (five times amended) A method of automatically roasting coffee beans to attain a predetermined, desired coffee aroma comprising the steps of roasting a sample of the beans to a degree at which coffee made with the beans exhibits the desired aroma; sensing one of a color and a darkness of the beans when the beans have reached the degree of roasting and from the sensed color or darkness generating a first parameter which is indicative of the sensed

color or darkness of the bean sample; storing the first parameter; thereafter roasting a batch of more than one pound of fresh beans by flowing heated air over the fresh beans; cleaning the heated air after it has passed the fresh beans so that the air is substantially pollutant-free[by flowing it through a filtration system including a catalytic converter]; cooling the air after the air has passed the fresh beans to [about room temperature] <u>no more than about 115° F</u> while continuing flowing the heated air over the fresh beans; discharging the cooled, pollutant-free[, room temperature] air into a substantially closed room frequented by humans; <u>the steps of roasting, cleaning, cooling and discharging being simultaneously and continuously performed while roasting is in progress;</u> monitoring one of the color and darkness of the fresh beans being roasted and generating a second parameter which is indicative of a color or darkness of the fresh beans; comparing the first and second parameters during roasting of the fresh beans; and terminating the roasting of the fresh beans when the first and second parameters match.

56. (six times amended) A method for uniformly roasting coffee beans at a plurality of geographically separate locations comprising placing a roasting machine at each location inside an enclosed room frequented by humans; equipping each roasting machine with a roasting container for holding fresh beans while the beans are being roasted, a hot air supply for heating the fresh beans to a roasting temperature, and an air removal system for directing used air away from the container; removing from the used air substantially all debris, smoke, oil, and other pollutants in a filtration system[including a catalytic converter]; after the step of removing, cooling [at least a portion of] the used air[and recirculating any remaining portion of the cooled air to the hot air supply]; discharging the at least a portion of [used] <u>the cooled</u> air [in its entirety] into the enclosed room while continuing heating the fresh beans; <u>recirculating a remaining portion of the cooled air to the hot air supply; the steps of removing, cooling, discharging and recirculating being simultaneously and continuously performed while roasting is in progress;</u> directing a laser light beam of a frequency in the range of between about 600-800 nm onto the beans in the container during roasting; generating an output signal from laser light reflected by the beans which is a function of the observed darkness of the beans; providing each roasting machine with a computer including a memory; feeding the output signal to the computer; at a central control station determining an optimal darkness for each bean type that will be roasted by the roasting machines; at the control station generating a

control signal which reflects the optimal darkness of each roasted bean type; downloading the control signal from the central control station to the computer of each roasting machine; during roasting at any given roasting machine comparing the control signal stored in the associated memory with the output signal generated by the instrument; when the compared signals match, generating a command signal; and using the command signal to terminate the roasting of the beans in the container.

62. (thrice amended) A method of roasting coffee beans comprising the steps of establishing the degree to which the coffee beans must be roasted to attain a desired aroma; generating a measurable first parameter which is indicative that the coffee beans have been sufficiently roasted to yield the desired aroma; storing the first parameter; roasting a batch of more than one pound of fresh coffee beans at a roasting temperature by flowing heated air over the fresh coffee beans; while flowing heated air over the fresh coffee beans removing substantially all pollutants from the air downstream of the fresh coffee beans being heated in a filtration system[including a catalytic converter], cooling at least a portion of the air downstream of the fresh coffee beans to [substantially room temperature] <u>no more than about 115° F</u>, and thereafter, while continuing to flow heated air over the fresh coffee beans, exhausting the cooled air directly into a room of a building without recirculating any part of the cooled air into the filtration system; monitoring a second parameter which is compatible with the first parameter and is generated by the fresh coffee beans during roasting; and, upon detecting a match between the first and second parameters, discontinuing the roasting step.

77. (amended) A method according to claim 71 wherein the roasting step comprises flowing heated air over the fresh coffee beans, and including the steps of removing substantially all pollutants from the air downstream of the fresh coffee beans being heated, cooling the air downstream of the fresh coffee beans to [substantially room temperature] <u>no more than about 115° F</u>, and thereafter exhausting the cooled air into an enclosed room of a building.

78. (amended) A method according to claim 71 wherein the step of roasting includes flowing heated air over the fresh coffee beans, and including the steps of filtering substantially all pollutants from the heated air following the roasting step, thereafter reheating

and recirculating a [relatively] major portion of the substantially pollutant-free air over the fresh coffee beans to thereby continue the roasting step; and discharging a [relatively] minor portion of the filtered air prior to reheating and recirculating the major portion of the air.

80. (twice amended) A method of roasting coffee beans in a supermarket located inside a building comprising the steps of establishing the degree to which the coffee beans must be roasted to attain a desired aroma; generating a measurable first parameter which is indicative that the coffee beans have been sufficiently roasted to yield the desired aroma; storing the first parameter; roasting fresh coffee beans at a roasting temperature by flowing heated air over the fresh coffee beans; while flowing heated air over the fresh coffee beans removing substantially all pollutants from the air downstream of the fresh coffee beans being heated, [including flowing the heated air through a filtration system having a catalytic converter,] cooling the air downstream of the fresh coffee beans to [substantially room temperature] <u>no more than about 115° F</u>, and thereafter, while continuing to flow heated air over the fresh coffee beans, exhausting the cooled air into the supermarket; monitoring a second parameter which is compatible with the first parameter and is generated by the fresh coffee beans during roasting; and, upon detecting a match between the first and second parameters, discontinuing the roasting step.

81. (twice amended) A method of automatically roasting coffee beans to attain a predetermined, desired coffee aroma comprising the steps of roasting a sample of the beans inside a supermarket to a degree at which coffee made with the beans exhibits the desired aroma; sensing one of a color and a darkness of the beans when the beans have reached the degree of roasting and from the sensed color or darkness generating a first parameter which is indicative of the sensed color or darkness of the bean sample; storing the first parameter; thereafter roasting fresh beans by flowing heated air over the fresh beans; cleaning the heated air after it has passed the fresh beans so that the air is substantially pollutant-free[, including flowing the heated air through a filtration system including a catalytic converter]; cooling the air after the air has passed the fresh beans to [about room temperature] <u>no more than about 115° F</u> while continuing flowing the heated air over the fresh beans; discharging the cooled, pollutant-free, room temperature air into the supermarket; monitoring one of the color and darkness of the fresh beans being roasted and generating a second parameter which is

indicative of a color or darkness of the fresh beans; comparing the first and second parameters during roasting of the fresh beans; and terminating the roasting of the fresh beans when the first and second parameters match.